

1 ABSTRACT

2 The invention relates to means and methods for the
3 orthogonal introduction of ions into a TOF mass spectrometer,
4 whereby ions from an ion source can be efficiently transferred
5 via a multipole ion guide such that they can be readily analyzed
6 in a TOF analyzer. The invention includes first introducing ions
7 into an ion guide, preferably an RF/DC ion guide, which guides
8 the ions into a multipole ion trap. Both the ion guide and ion
9 trap are preferably orthogonal to the flight direction of the TOF
10 mass spectrometer. By changing the potentials on the electrodes
11 of the multipole ion trap, the ions may be extracted from the
12 trap in the direction of the flight region. Also, in accordance
13 with the invention, the entrance region of the ion guide is held
14 at moderate pressure to cool the ions to thermal energies. These
15 ions are cooled due to collisions with neutral background gas
16 molecules, thus lowering the energy spread of the ions.
17 Preferably, the invention uses different DC and RF electrodes to
18 trap and extract ions. By minimizing the energy spread of the
19 ions, the invention results in improved performance of any TOF
20 mass spectrometer.